中华人民共和国国家知识产权局

邮政编码：	发文日期：
香港湾仔港湾道23号鹰君中心22字楼 中国专利代理(香港)有限公司 王其灏	
申请号：01120787.6	

申请人：	住友化学工业株式会社
发明名称：	制备热塑性树脂组合物的方法

第一次审查意见通知书

0161183

1. ☒ 依申请人提出的实审请求，根据专利法第35条第1款的规定，审查员对上述发明专利申请进行实质审查。
   ☐ 根据专利法第35条第2款的规定，国家知识产权局决定自行对上述发明专利申请进行审查。
2. ☒ 申请人要求以其在：

   JP 专利局的申请日 2000年4月28日 为优先权日，
   _____ 专利局的申请日 _____ 为优先权日，
   _____ 专利局的申请日 _____ 为优先权日，
   _____ 专利局的申请日 _____ 为优先权日，

   ☒ 申请人已经提交了经原申请国受理机关证明的第一次提出的在先申请文件的副本。
   ☐ 申请人尚未提交经原申请国受理机关证明的第一次提出的在先申请文件的副本，根据专利法第30条的规定视为未提出优先权要求。
3. ☐ 申请人于____年__月__日和____年__月__日提交了修改文件。
   经审查，其中：____年__月__日提交的____不符合实施细则第51条的规定；
   ____年__月__日提交的____不符合专利法第33条的规定。
4. ☒ 审查是针对原始申请文件进行的。
   ☐ 审查是针对下述申请文件进行的：

   说明书 申请日提交的原始申请文件的第____页；
   ____年__月__日提交的第____页；____年__月__日提交的第____页；
   ____年__月__日提交的第____页；____年__月__日提交的第____页；
   权利要求 申请日提交的原始申请文件的第____项；
   ____年__月__日提交的第____项；____年__月__日提交的第____项；
   ____年__月__日提交的第____项；____年__月__日提交的第____项；
   附图 申请日提交的原始申请文件的第____页；
   ____年__月__日提交的第____页；____年__月__日提交的第____页；
   ____年__月__日提交的第____页；____年__月__日提交的第____页；
   说明书摘要 ☐申请日提交的； ☐____年__月__日提交的；
   摘要附图 ☐申请日提交的； ☐____年__月__日提交的。
5. ☐ 本通知书是在未进行检索的情况下作出的。
   ☒ 本通知书是在进行了检索的情况下作出的。
   ☒ 本通知书引用下述对比文献(其编号在今后的审查过程中继续沿用)：

14 JUN 2004

回函请寄：100088 北京市海淀区蓟门桥西土城路6号 国家知识产权局专利局受理处收
(注：凡寄给审查员个人的信函不具有法律效力)

编号	文件号或名称	公开日期（或抵触申请的申请日）
1	GB1537240	1978-12-29
2	JP8283556A	1996-10-29
3		
4		

6. 审查的结论性意见：

☐ 关于说明书：

☐ 申请的内容属于专利法第 5 条规定的不授予专利权的范围。

☐ 说明书不符合专利法第 26 条第 3 款的规定。

☐ 说明书不符合专利法第 33 条的规定。

☐ 说明书的撰写不符合实施细则第 18 条的规定。

☒ 关于权利要求书：

☐ 权利要求____不具备专利法第 22 条第 2 款规定的新颖性。

☒ 权利要求1-7不具备专利法第 22 条第 3 款规定的创造性。

☐ 权利要求____不具备专利法第 22 条第 4 款规定的实用性。

☐ 权利要求____属于专利法第 25 条规定的不授予专利权的范围。

☐ 权利要求____不符合专利法第 26 条第 4 款的规定。

☐ 权利要求____不符合专利法第 31 条第 1 款的规定。

☐ 权利要求____不符合专利法第 33 条的规定。

☐ 权利要求____不符合实施细则第 2 条第 1 款关于发明的定义。

☐ 权利要求____不符合实施细则第 13 条第 1 款的规定。

☐ 权利要求____不符合实施细则第 20 条至第 23 条的规定。

上述结论性意见的具体分析见本通知书的正文部分。

7. 基于上述结论性意见，审查员认为：

☐ 申请人应按照通知书正文部分提出的要求，对申请文件进行修改。

☐ 申请人应在意见陈述书中论述其专利申请可以被授予专利权的理由，并对通知书正文部分中指出的不符合规定之处进行修改，否则将不能授予专利权。

☒ 专利申请中没有可以被授予专利权的实质性内容，如果申请人没有陈述理由或者陈述理由不充分，其申请将被驳回。

☐

8. 申请人应注意下述事项：

（1） 根据专利法第 37 条的规定，申请人应在收到本通知书之日起的_肆_个月内陈述意见，如果申请人无正当理由逾期不答复，其申请将被视为撤回。

（2） 申请人对其申请的修改应符合专利法第 33 条的规定，修改文本应一式两份，其格式应符合审查指南的有关规定。

（3） 申请人的意见陈述书和/或修改文本应邮寄或递交给国家知识产权局专利局受理处，凡未邮寄或递交给受理处的文件不具备法律效力。

（4） 未经预约，申请人和/或代理人不得前来国家知识产权局专利局与审查员举行会晤。

9. 本通知书正文部分共有2页，并附有下述附件：

☒ 引用的对比文件的复印件共2份 13 页。☐

审查 8 部 6 室　　审查员签章：8620　　完成日期：2004-01-07

回函请寄：100088 北京市海淀区蓟门桥西土城路6号 国家知识产权局专利局受理处收
（注：凡寄给审查员个人的信函不具有法律效力）

第一次审查意见通知书正文

申请号：01120787.6

如说明书所述，本申请涉及一种制备热塑性树脂组合物的方法。经审查，现提出如下审查意见。

1．权利要求 1 所要求保护的技术方案不具备创造性，不符合专利法第 22 条第 3 款的规定。对比文件 1（GB1537240）公开了一种制备含填料的热塑性模塑组合物的方法，并具体公开了以下的技术特征“使用双螺杆挤出机，挤出机具有一个上游供料部分和一个下游供料部分，所述上游供料部分和下游供料部分之间的长度与螺杆直径的比为 3－12，将热塑性树脂从上游供料部分供入，从下游供料部分可以供入填料，如玻璃纤维，碳酸钾纤维，玻璃球等”（参见对比文件 1 的说明书第 2 页第 45－59，69－77 行及附图 1）。该权利要求所要求保护的技术方案与该对比文件所公开的技术内容相比，其区别仅在于“权利要求中的热塑性树脂比重为 1.10 或更高，填料为空球”，然而这种区别虽然没有在对比文件 1 中公开，但对于本领域的技术人员来说，不需要付出创造性劳动就可以得到该权利要求所要求保护的技术方案，在该对比文件的基础上结合上述区别技术特征以获得该权利要求所要求保护的技术方案，对所属技术领域的技术人员来说是显而易见的，因此该权利要求所要求保护的技术方案不具备突出的实质性特点和显著的进步，因而不具备创造性。

2．权利要求 2 的附加技术特征“进一步将无机填料从上游侧供料部分和/或下游侧供料部分供入”也在对比文件 1 中公开（参见对比文件 1 说明书第 2 页第 22－44 行及表格，附图），“液晶聚酯树脂”这一特征在对比文件 2（JP8283556A）中公开（参见对比文

件 2 权利要求 1），在对比文件 1 的基础上结合对比文件 2 得出该权利要求所要求保护的技术方案，对本领域的技术人员来说是显而易见的，而且它们的结合没有产生预料不到的效果，因此该权利要求不具备突出的实质性特点和显著的进步，因而不具备专利法第 22 条第 3 款所规定的创造性。

3．权利要求 3 和 4 加入了附加技术特征，但加入附加技术特征后所要求保护的技术方案与对比文件 1 和 2 所公开的现有技术相比，没有产生意想不到的效果，不具备突出的实质性特点和显著的进步，因此，不符合专利法第 22 条第 3 款有关创造性的规定。

4．权利要求 5—7 加入了附加技术特征，但这些特征已在对比文件 2 中公开（参见对比文件 2 的权利要求 1，2 及英文摘要），在对比文件 1 的基础上结合对比文件 2 得出该权利要求所要求保护的技术方案，对本领域的技术人员来说是显而易见的，而且它们的结合没有产生预料不到的效果，因此该权利要求不具备突出的实质性特点和显著的进步，因而不具备专利法第 22 条第 3 款所规定的创造性。

基于上述理由，本申请的独立权利要求以及从属权利要求都不具备创造性，同时说明书中也没有记载其他任何可以授予专利权的实质性内容，因而即使申请人对权利要求进行重新组合和／或根据说明书记载的内容作进一步的限定，本申请也不具备被授予专利权的前景。如果申请人不能在本通知书规定的答复期限内提出表明本申请具有创造性的充分理由，本申请将被驳回。

PATENT SPECIFICATION (11) 1 537 240

1 537 240

(21) Application No. 13619/75 (22) Filed 3 Apr. 1975
(23) Complete Specification Filed 19 Mar. 1976
(44) Complete Specification Published 29 Dec. 1978
(51) INT. CL.² B29B 1/04 // 1/10
(52) Index at Acceptance
B1C 19G4A1 19G4A2 19G4B 1 9

(72) Inventor: KENNETH JOHN TAYLOR

(19)

(54) PROCESS FOR PRODUCING THERMOPLASTIC MOULDING COMPOSITIONS

(71) We, TBA INDUSTRIAL PRODUCTS LIMITED a Company organised under the laws of Great Britain, of 20 St. Mary's Parsonage, Manchester M3 2NL (formerly of 77 Fountain Street, Manchester M2 2EA), do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:–

This invention relates to a process for producing thermoplastic moulding compositions containing more than one filler and/or fibrous reinforcing agent.

It is known that compounding-screw machines, such as screw extruders, injection moulding machines and mixers, can be used to compound a particulate fillter or fibrous reinforcing agent with a plasticized mass of thermoplastic polymeric material. Different fillers and reinforcing agents have different mechanical strengths and physical properties, and hence the operating parameters of such a machine must be changed when a batch of one thermoplastic material with one type of fillter or reinforcing agent is changed for another batch of thermoplastic material with a different filler or reinforcing agent. This problem is accentuated when it is desired to compound a thermoplastic material with two fillers or reinforcing agents of different mechanical strengths and/or physical properties.

According to the present invention, a process for producing a thermoplastic moulding composition comprises:–

(i) feeding to the barrel of a compounding screw machine, at a relatively upstream location, a component which is a relatively difficultly dispersible particulate filler of fibrous reinforcing agent;

(ii) separately feeding to a relatively downstream location a component which is a relatively easily mechanically degradable particulate filler or fibrous reinforcing agent; and

(iii) simultaneously with (i) and (ii), supplying a thermoplastic polymeric material to the machine and operating the machine to disperse both said components through the thermoplastic polymeric material.

Hereinafter reference will be made to 'multicomponent reinforcement' by which we mean a moulding composition additive which consists of (a) at least one component which is a relatively difficultly dispersible filler or fibrous reinforcing agent and (b) at least one component which is a relatively easily mechanically degradable filler or fibrous reinforcing agent, component (a) being referred to hereafter (simply for convenience) as the 'tough' component and component (b) being referred to a as the 'weak' component.

By virtue of this process, it is possible to subject each component to sufficient work to disperse it in the polymeric material but to insufficient work to effect substantial mechanical degradation of either component, particularly the 'weak' component.

The production of known multicomponent reinforcement thermoplastic moulding compositions can involve three (or even more) stages, for example the production of a 'masterbatch' of one of the components dispersed in thermoplastic polymer, the production of another 'masterbatch' of another of the components dispersed in thermoplastic polymer, and subsequently blending in pellet form the two masterbatches thus obtained. By virtue of the present invention it is possible to reduce the production of such a moulding composition to a single stage with reduction in costs.

In a preferred aspect of the present invention, the process comprises:–

(a) providing a compounding screw machine having a barrel length: screw diameter ratio (L/D ratio) of at least 9:1;

(b) feeding thermoplastic polymeric material to an upstream location in the barrel; and

(c) simultaneously with (b), either:–

(i) feeding the 'tough' component to the upstream location and the 'weak' component to a down-stream location, or

(ii) feeding the 'tough' component to a first downstream location and the 'weak' component to a further downstream location.

The machine may be a single screw compounding extruder but preferably is a twin-screw compounding extruder. When a twin-screw extruder is used, the L/D ratio is determined by reference to the diameter of one of the screws; the screws may be rotated in the same direction (i.e. co-rotated) or may be rotated in opposite directions (i.e. contra-rotated). Preferably the L/D ratio is at least 15:1.

The thermoplastic polymeric material may be any melt processable thermoplastic polymer, preferably a polyamide, a polyester (and especially polybutylene terephthalate or polycarbonate), an acetal, polyphenylene oxide, a polyolefin, polystyrene, styrene/acrylonitrile copolymer, acrylonitrile/ butadiene/ styrene copolymer or a mixture of at least two thereof, and may in corporate a processing aid (selected, for example, from stabilisers, plasticizers and lubricants) and/or a modifier (selected, for example, from fire retardant additives, pigments, and the like).

hhe preferred fillers and fibrous reinforcing agents may be classified in groups:

A. Asbestos, talc, dolomite, treated and untreated calcium carbonates, silica sand, carbon black, titanium dioxide, Kieselguhr, anhydrite, glass fibres as milled glass (any one or more of these preferably forms the relatively difficultly dispersible component of the reinforcement);

B. Glass fibres as chopped strang or roving or milled glass, potassium titanate fibres, carbon fibres (these may be considered relatively easily degradable with respect to group A, or relatively difficultly dispersible with respect to group C);

C. Potassium titanate fibres, calcium sulphate fibres natural and synthetic calcium silicate fibres, vermiculite in natural or expanded form, mica (these are relatively easily degradable with respect to Groups A and B).

D. Solid glass spheres – these are both easily dispersed and relatively undegradable (mechanically).

Preferred embodiments of the present invention will now be described by way of example with reference to the accompanying drawings, in which each of the four figures is a schematic representation of the barrel of a twin-screw extruder, showing the method of feeding thereto the components of a multi-component reinforcement thermoplastic moulding composition.

In all of Figures 1 to 4, a twin screw extruder has a barrel indicated generally at 5, carrying at its downstream end a die 6 for forming the moulding composition into a rod-like extrudate which can, if desired, be chopped into pellets.

In Figure 1, the extruder has an upstream feed inlet 1, a downstream feed inlet 2, and a vent V for venting the barrel; in Figures 2 and 3 there is additionally a further downstream feed inlet 3, and in Figure 4 there is a still further downstream feed inlet4. Vent V is omitted from the embodiment of Figures 2,3 and 4, but if venting is desired, the vent should be located between feed inletes 2 and 3 in Figures 2 and 3 and between feed inlets 3 and 4 in Figure 4. The preferred ranges of L/D ratio for each zone between the neighbouring feed inlets and between the furthest downstream feed inlet and the die, are shown in each of the Figures.

Using the classification A to D for fillers and fibrous reinforcing agents, the designation P for the thermoplastic material, the designation S for supplementary additives (such as, for example, stabilisers, fire-retardants, plasticizers, lubricants, pigments and mould release agents), the following Table outlines programs for feeding all the components to extruders as described above with reference to each of Figures 1 to 4.

Figure	Feed 1	Feed 2	Feed 3	Feed 4
1	P + S + A	B or C	–	–
2	P + S + A	B	C	–
3	P + S	A	B or C	–
4	P + S	A	B	C

Solid glass spheres (group D) may be fed to the extruder at any convenient location, having regard to the possible effect of their inclusion at any location upstream of the feed of a 'weak' component.

Using the process described above, it is possible to produce compositions of the type described in UK Patent Specification No. 1369589, more efficiently than by the method disclosed therein.

WHAT WE CLAIM IS:-

1. A process for producing a thermoplastic moulding composition, which comprises:

(i) feeding to the barrel of a compounding screw machine, at a relatively upstream location, a component which is a relatively difficultly dispersible particulate filler or fibrous reinforcing agent;

(ii) separately feeding to a relatively downstream location a component which is a relatively easily mechanically degradable particulate filler or fibrous reinforcing agent; and

(iii) simultaneously with (i) and (ii), supplying a thermoplastic polymeric material to the machine and operating the machine to disperse both said components through the thermoplastic polymeric material.

2. A process according to claim 1, comprising:

(a) providing a compounding screw machine having a barrel length: screw diameter ratio (L/D ratio) of at least 9:1;

(b) feeding thermoplastic polymeric material to an upstream location in the barrel, and

(c) simultaneously with (b), either:-

(i) feeding the first-mentioned component to the upstream location and the second-mentioned component to a downstream location, or

(ii) feeding the first-mentioned component to a first downstream location and the second-mentioned component to a further downstream location.

3. A process according to claim 1 or claim 2, wherein the compounding screw machine is a twin screw extruder and the screws are co-rotated.

4. A process according to claim 1 or claim 2, wherein the compounding screw machine is a twin screw extruder and the screws are contra-rotated.

5. A process according to any one of the preceding claims, wherein the compounding screw machine has a barrel having an internal length to diameter ratio of at least 15:1.

6. A process according to any one of the preceding claims, wherein the thermoplastic polymeric material is selected from polyamides, polyesters, acetals, polyphenylene oxide, polyolefins, polystyrene, styrene/acrylonitrile copolymers, acrylonitrile/butadiene/styrene copolymers and mixtures of at least two thereof.

7. A process according to any one of the preceding claims, wherein the thermoplastic polymeric material incorporates a processing aid.

8. A process according to any one of the preceding claims, wherein the thermoplastic polymeric material incorporates a modifier.

9. A process according to any one of the preceding claims, wherein the relatively difficulty dispersible component is selected from asbestos, talc, dolomite, treated and untreated calcium carbonates, silica sand, carbon black, titanium dioxide, ieselguhr, anhydrite, and glass fibres as milled glass.

10. A process according to claim 9, wherein the relatively easily degradable component is selected from glass fibres in the form of chopped strand or roving or milled glass, potassium titanate fibres, carbon fibres, calcium suphate fibres, natural and synthetic calcium silicate fibres, vermiculite in natural or expanded form, and mica.

11. A process according to any one of claims 1 to 8, wherein the relatively difficulty dispersible component is selected from glass fibres in the form of chopped strand or roving or milled glass, potassium titanate fibres and carbon fibres, and the relatively easily degradable component is selected from potassium titanate fibres (when these are not present as the relatively difficulty dispersible component), calcium sulphate fibres, natural and synthetic calcium silicate fibres, vermiculite in natural or expanded form, and mica.

12. A process according to any one of claims 1 to 8, wherein one of the components comprises solid glass spheres.

13. A process for producing a thermoplastic moulding composition, substantially as hereinbefore described with reference to any one of the Figures 1 to 4 of the accompanying drawings.

14. A thermoplastic moulding composition whenever produced by a process as claimed in any one of the preceding claims.

15. Mouldings made from a composition as claimed in claim 14.

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Chartered Patent Agent
Agent for the Applicants.

Printed for Her Majesty's Stationery Office, by Croydon Printing Company Limited, Croydon, Surrey, 1978.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

1537240 COMPLETE SPECIFICATION
1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

FIG. 1

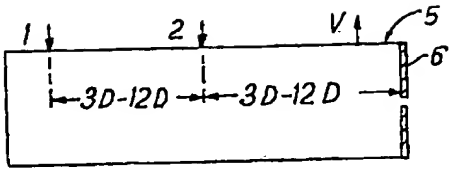


FIG. 2

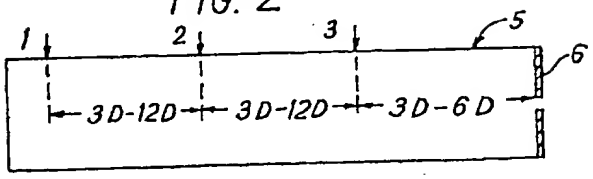


FIG. 3

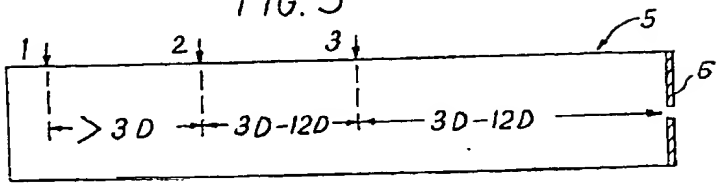
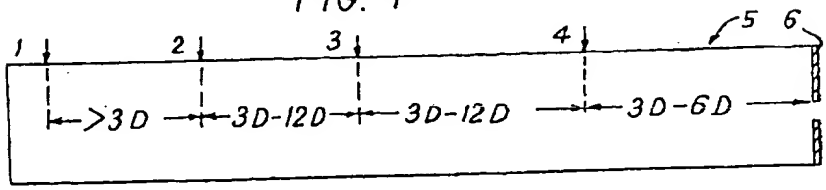


FIG. 4



PN - JP8283556 A 19961029 DW199702 C08L67/03 008pp

IC - C08G63/00 ;C08K5/00 ;C08L67/00 ;C08L67/03 ;C09K19/38

PA - (SUMO) SUMITOMO CHEM CO LTD

TI - Liq. crystalline polyester resin mixt. for improved mechanical properties - comprises fluorocarbon-based surfactant and liq. crystalline polyester resin, and filler, for moulding for high thermal stability

AB - J08283556 The mixt. is prepd. by blending 0.001-5, (0.003-3) pts.wt. of fluorocarbon-based surfactant into 100 pts.wt. of liq. crystalline resin compsn. comprising 100 pts.wt. of liq. crystalline polyester and 0-150 pts.wt. of filler at a temp. below flow point of the resin compsn. and as specified below. Flow point = temp. at which the resin shows a melt viscosity of 48,000 poises when heated at a heating rate of 4 deg.C/minute and extruded through a nozzle having an inner dia. of 1 mm and a length of 100 mm under load of 100 kgf/cm2. The liq. crystalline polyester contains at least 30 mol % of repeated structural unit of formula (A1).

- Also claimed is a method for forming moulded prods. from the resin mixt..

- ADVANTAGE - The liq.-crystalline polyester resin mixt. is plasticised under stabilised condition in moulding and processing operations and produces moulding with improved mechanical properties and high thermal stability.